Volume 28, Number 1

inps journal

Indiana Native Plant Society

Spring 2021

Plant This, Not That

Beautiful but Deadly: Nandina Kills Birds

By Gillian Field[1]

I thought I knew most of the invasive plant species in southern Indiana that are the chief causes of concern. But, regrettably, there is always a new plant to learn about. Ramsay Harik, a Monroe County Master Gardener and owner of Deep Roots Landscape Design, brought the ornamental landscaping plant nandina (*Nandina domestica)* to my attention. He pointed out "that while it's perhaps hard to think of such an attractive shrub as a dangerous plant to our wildlife and pets, such is indeed the case. More to the point, nandina kills the very songbirds that desperately need our support." Ramsay suggests, "If you do have nandina in your yard, please consider replacing it with native berry-producing shrubs such as winterberry, chokeberry, serviceberry, red twig dogwood, and native viburnums." And he adds, "The birds will thank you, and your conscience will rest easier."

petpoisonhelpline.com

*Nandina, a member of the Barberry family (*Berberidaceae*), has two-seeded fleshy fruits, cane-like stems, and compound leaves. It is hardy in southern Indiana, especially in the Ohio Valley.*

Native plants have evolved with our native insects, birds, and other wildlife for millions of years, and thus offer birds the necessary and appropriate food, cover, and insect larvae for their fledglings. On the other hand, plants introduced in the last hundred years from other continents, do not, and in fact can prove poisonous to our native birds, as in the case of nandina. When deciding what to keep in our yards and what needs to be removed it is critically important to understand why native plants are essential to supporting all native wildlife on this continent, and why introduced plants can do so much harm.

[1] *Editor's Note: This article is based on an original version that appeared in* The Herald-Times, *Bloomington, Indiana, on Dec. 20, 2020.*

Ramsay continues with more detail: "One of the many rewards of having native plants in our yards is the abundance of songbirds drawn to their nutritious seeds and berries. However, nandina, often marketed as heavenly-bamboo or sacred-bamboo, produces berries containing high levels of cyanide (as cyanogenic glycosides), making them deadly to birds and other animals (including pets!). What's more, they produce their berries in late fall, just in time for hungry migrating birds to be drawn to them. Though in Indiana nandina hasn't yet spread to untended areas the way Asian bush honeysuckle (*Lonicera* spp.), burning bush (*Euonymus alatus)*, and privet (*Ligustrum* spp.) have, it is classified by the US Department of Agriculture, as well as the Missouri Botanical Garden, as a "noxious, invasive, non-native weed."

To help you make some great native plant choices, here are highly recommended, Ramsay-approved shrubs for your yard.

Aronia melanocarpa - Black chokeberry has gorgeous black berries and purple or red leaves in the fall and looks especially attractive in a group or as a border shrub.

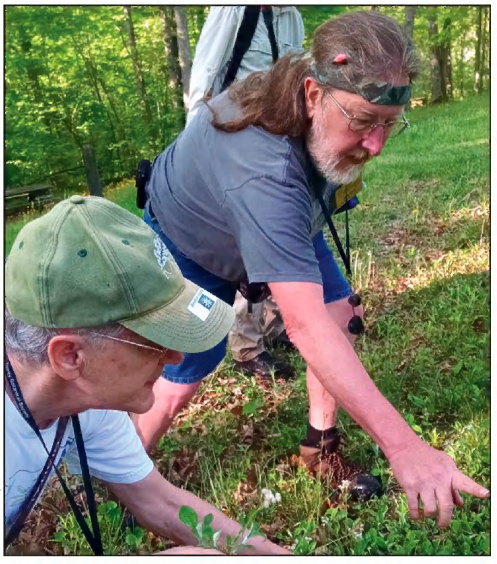
Calycanthus floridus - Carolina allspice is deliciously fragrant with brownish berries. Technically this shrub is a near-native since its natural range is mostly North Carolina and south through Alabama. [I grew this native shrub

Nandina – continued on page 4

Inside

My Solo Florathon

By David Mow



Ellen Jacquart

David Mow (with Paul Rothrock in foreground) in a pre-COVID Florathon. The site, in Morgan-Monroe State Forest, has a population of single-head pussytoes, Antennaria solitaria.

David Mow

*Swamp saxifrage (*Micranthes pensylvanica*) inhabits a small swamp near Burkhart Creek County Park in Morgan County.*

Life changed dramatically in 2020; this included our Florathon wildflower contest. Having been part of the winning team (Blooming Stellaria's) during the first two years of the Florathon, I wanted to complete a solo outing and put in a good showing for the team. In the past we covered four counties in the south-central part of the state. Based upon the first two years I have learned where the rare and uncommon plants are to be found, knowledge that I greatly enjoy.

In the past, all members of the team had to be present when we identified a plant, so there was always more than one person to verify that we had seen something in flower. This being a solo event, I decided I needed to photographically document what I saw. Given the shutterbug that I am, this may have been a mistake. I cannot take just one photo of a plant and so ended up with 396 photos. This took time I could have used to find more plants and may have contributed to my second-place finish.

One of the big challenges was when to start. I chose May 12th hoping to balance fading early bloomers with species from a second wave. I started in my backyard, Morgan-Monroe State Forest, where I found abundant blue-eyed Mary (*Collinsia verna*) and yellow lady's-slipper (*Cypripedium parviflorum* var. *pubescens*) along with numerous bottomland and upland species such as Jacob's ladder (*Polemonium reptans*) and round-leaved ragwort (*Packera obovata*).

I then travelled to Brown County State Park, where I have been working on an herbarium for the Nature Center for the last six years. As a result, I now have extensive knowledge of where particular species are in the park.This allowed me to score several orchids, whorled pogonia (*Isotria verticillata*) and showy orchis (*Galearis spectabilis*), along with locally frequent cleft phlox (*Phlox bifida*) and wild comfrey (*Cynoglossum virginianum*), and large white trillium (*Trillium grandiflorum*) which is rare in southern Indiana.

Next, I was off to Cedar Bluff's Nature Preserve, a Nature Conservancy property and a well-known botanical hotspot in Monroe County. Here wild columbine (*Aquilegia canadensis*), bastard toadflax (*Comandra umbellata*), and yellow star-grass (*Hypoxis hirsuta*) were added to my growing tally.

While having lunch on the fly, I made a quick drive down SR 46 to McCormick's Creek State Park. The bluff areas there support shooting star (*Dodecatheon meadia*), yellow pimpernel (*Taenidia integerrima*), and pennywort (*Obolaria virginica*). It was only recently that I added pennywort to the IU herbarium as an Owen County record. I would have loved to go deeper into the park but opted instead to head to several sites nearer my home.

I rounded out my tally at 87 native wildflowers with a quick stop at Bean Blossom Bottoms, where I found blue-flag iris (*Iris virginica*) and stitchwort (*Stellaria longifolia*) and Ravinia Woods / Burkhart Creek Park, where swamp saxifrage (*Micranthes pensylvanica*) was flowering along with wild strawberry (*Fragaria virginiana*) and early horse-gentian (*Triosteum aurantiacum*). The day covered over 250 miles but reinforced for me the richness of Indiana's spring ephemeral flora. What a glorious display!

*David Mow is a self-taught botanist with over 30 years in the woods and fields (20 years on a daily basis) and an eye honed by years of hunting morels (*Morchella *sp.) and Native American artifacts. He is a member of the South Central Chapter of INPS.*

President's Message

By Ellen Jacquart

Last year the INPS Council circulated an online member survey to gather information necessary for developing a five-year strategic plan for our organization. Fully one-third of our members responded, 306 members who answered the many questions we posed about how to be a better organization and more fully meet our mission. Not only was the number of responses impressive, the level of detail and the number of suggestions for the future were helpful indeed. The INPS Council met twice in January for a Zoom strategic planning retreat to consider these responses and what our priorities should be. Our hope is to complete a strategic plan for 2021-2025 by the end of April.

One surprise for me in the responses was the number of members not familiar with all of the perks of membership and the resources that are available. You, faithful reader of the Journal, may be better informed than this, but here's a quick summary of resources available to you from INPS.

Website – *IndianaNativePlants.org*, newly revised, will connect you to every resource mentioned here.

Journal – you probably know you can receive it by email or hard copy, but did you know that past Journals are on the website? Just enter 'journal' into the search box in the upper right corner of the website.

Facebook Page and Group – the INPS Page (*www.facebook.com/IndianaNativePlants*) is where we post updates on our programs and topics of interest – please 'like' this page to support the group. The INPS Group (www.facebook.com/groups/105273756180332) is where over 18,000 members discuss native plants every day, asking for everything from native plant identifications to landscaping ideas. Join it to be part of the conversation!

YouTube Channel – The INPS channel is new, but it already has the annual conference video posted. Many more videos on native plants and landscaping will be added in the coming months, so subscribe now to see new content. *www.youtube.com/channel/UC4uXb_c2U5DdzwQ4zfzD1Xg*

Grow Indiana Natives – This INPS program promotes native plant sellers and designers, but it also certifies native gardens. If you grow native species, consider getting your garden certified. Just click on the 'Landscaping' dropdown on the website and choose 'Grow Indiana Natives Certification Program' to apply.

There's so much more INPS provides that you can find out about by exploring *IndianaNativePlants.org* – Biodiversity grants, Letha's Fund grants to get children out in nature, the Native Plant Wizard Patch program for children 5 through 16, chapter hikes and events, and more. I'm confident that we'll be adding even more to these resources based on the strategic plan we're drafting. Thanks for your support!

Wake Up, Woods!

Don't forget to pick up a copy of *Wake Up, Woods* before our spring ephemerals pop from their winter sleep. Also, be sure your friends and family, young and old and in between, have their own copies of *Wake Up, Woods*, replete with breath-taking botanical illustrations of springtime's native flora and their pollinators as well as scientific information and charming poetry. This award-winning book, created in 2019 by the Indiana Native Plant Society, sold out twice. You may now find *Wake Up, Woods* in many locations including Kids Ink Children's Bookstore in Indianapolis, state park gift shops, the Indiana State Museum, and online. Spread the joy of this highly praised publication! *indiananativeplants.org/education/wakeupwoods/*

Melissa Moran

Wake Up, Woods *is a captivating introduction to our spring ephemerals for readers of every age.*

Nandina - *continued from page 1*

from seed from a past Annual INPS Conference seed swap. But what happened to it? I have a nagging feeling that I forgot where I planted it, then weeded it. Since this mishap, I have redoubled my efforts at making clear, legible, and prominent plant labels! A big thank you to those who save and share native seeds; I promise to do better the next time you give up your precious seeds to share.]

Ilex verticillata - Winterberry is dioecious, so grab yourself a male and female plant to produce red berries. For a beautiful winter bird garden, one male to 6-10 female plants is a good ratio.

Becky Matsudara - Wikimedia

*Cedar waxwing (*Bombycilla cedrorum*), heavy fruit feeders, are particularly endangered by nandina fruit (see vet.uga.edu, search* Bombycilla cedrorum*).*

Rhus aromatica - Fragrant sumac is my husband's favorite shrub. It has clusters of tiny yellow flowers that bloom at the twig tips in early spring before the foliage emerges. The catkins (male flowers) and clusters (female flowers) sometimes appear on the same plants (monoecious), but more commonly, on different plants (dioecious). Small clusters of hairy, red berries appear in summer.

Symphoricarpos orbiculatus - Coralberry is super easy to grow to form a thicket or to cut the runners to pot and share with neighbors. It has very pretty round, pink berries that stay present through the winter.

Viburnum dentatum - Arrowwood viburnum, a dense shrub with blue to black berries, is a great choice for replacing privacy hedges of invasive plantings like privet and rose-of-Sharon (*Hibiscus syriacus*).

Become familiar with these attractive berry producing shrubs and enjoy the added knowledge that you are providing birds the foods that serve them best. Make a plan today to jump in and replace any invasive or toxic nonnatives in your yard.

Want to learn more about nandina? Visit *ar.audubon.org/news/nandina-berries-kill-birds*. See also *www.aspca.org* and search for nandina.

Gillian has been active in organizing her local neighborhood in promoting native plants (especially see mc-iris.org/partners.html), often raising and giving away "starts." Recently she has become a regular contributor to the local newspaper. Of course, she is a member of the South Central Chapter of INPS.

INPS Plant Auction 2021

The 2021 INPS Plant Auction is going virtual AND statewide! The online auction will be open for bidding from Sunday, May 16, to Saturday, May 22, 2021. Live-streamed events, including educational content and a live auction, are also being planned!

Traditionally held one beautiful May day in Indianapolis, this new auction format will have the advantage of reaching members and non-members throughout Indiana.

In addition to premium native plant specimens from nurseries in the *Grow Indiana Natives* program, we will offer select curated items and services to entice bidders. The pick-up location of each plant or plant package will be clearly designated in item descriptions, and bidders will retrieve their winnings at the donor nurseries.

To replace the "home grown" plants we've offered in previous years (a beloved tradition!), members and chapters are encouraged to hold plant swaps or other events to share items from personal gardens.

As the auction week approaches, check the INPS website and social media pages for details. If you are a member, grower, or business owner and have interest in sponsorship, please reach out using this email: plantsale@indiananativeplants.org.

Start planning now for your 2021 Florathon outing!

This year's Florathon proceeds support the Letha's Youth Outdoors Fund, which puts kids in touch with nature.

For more info visit *indiananativeplants.org/inps-sponsored-events/florathon/*

Grab Your Camera: 2021 Photographic Scavenger Hunt

By Paul Rothrock

This year INPS members have TWO ways to employ their cameras while engaging with the glories of Indiana's flora. The first is to capture the most aesthetically pleasing images possible and submitting your best to the INPS Photo Contest. The second involves sleuthing and participation in a larger crowdsourcing effort, a Photographic Scavenger Hunt.

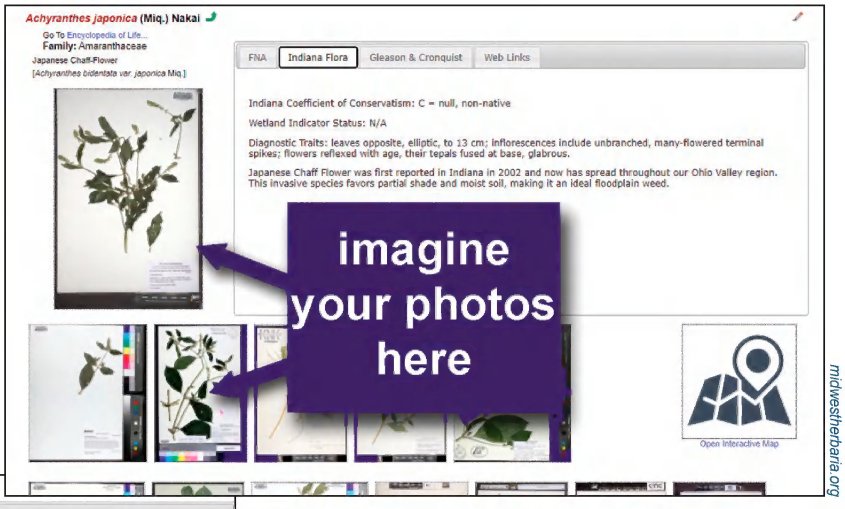
The goal of the Hunt is to obtain diagnostic photos of species in Indiana's flora (i.e., photos that highlight critical characters for species identification). The Hunt approach is necessary because each region of Indiana has its own suite of unique species. Collectively, the images from the Hunt will find their way to the *midwestherbaria.org* website (as well as to INPS publications) and support a greater understanding of the flora of Indiana for years to come.

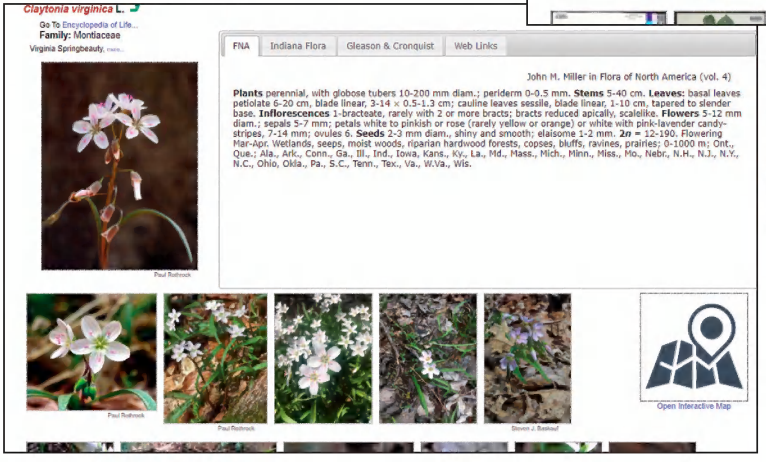
You will recall the introduction of the midwestherbaria.org website that was part of the 2019 INPS Annual Conference. This powerful tool provides user-friendly access to the herbaria databases and the approximately 2700 species in Indiana's flora. The site includes Species Pages that detail what each looks like and where it grows. While many Species Pages are supported by good photos, it should not be a surprise that in many cases photos are lacking … or few … or of poor quality … or do not adequately illustrate critical traits.

Thanks to generous funding that includes INPS, the IU Herbarium is spearheading the effort to fill that gap. Find full details at the Scavenger Hunt website: *herbarium.bio.indiana.edu*. It includes lists of target species broken down by month and the natural regions of Indiana where they occur. The website also fleshes out how to identify the species, get historical records of where it was known to grow, and, of course, instructions for submitting photos and what information should accompany your images.

So grab your cameras, develop your lists and strategy, and meet spring head-on!

Paul Rothrock is the INPS Journal editor and Associate Curator Emeritus of the Indiana University Herbarium.





Above: Species page for Japanese chaff-flower (Achyranthes japonica) *with only herbarium specimen photos.*

At left: Species page for spring beauty, Claytonia virginica*: complete with diagnostic photos of live plants.*

The 2020 INPS

By Lee Casebere

The 2020 photo contest drew the interest of many good photographers, which resulted in considerable hand wringing by the judges when making their choices for the prize-winning entries. By the numbers, there were 162 entries in the "plant portrait" category, 64 in the "landscape scene" category, and 16 in the "student plant portrait" category. These numbers are considerably higher than those submitted during the first contest in 2019, and the quality of the entries was better as well. The quality was high enough in the plant portrait category that the judges asked for and received permission to award a few honorable mentions.

Although entries were up and of better quality in the landscape scene category, they leaned heavily toward scenes of summer and fall wildflowers, especially prairie plants. It is our hope that more scenes with spring ephemeral woodland wildflowers will turn up in future contests. Since this issue of the Journal is hitting the streets as spring ephemerals are in bloom, get out there now and get those shots!

And remember, the landscape scene category is meant to showcase native species being used in man-created circumstances such as at homes, businesses, churches, and the like. Do not submit photos for this category taken in natural areas.

As photographers prepare for the next contest, here are some things to think about. First, remember that the contest is for species native to Indiana, and that plants in photos should be identifiable to at least the genus level, but preferably to the species level. With that in mind, though, think creatively and take shots of plants in different stages of their yearly development. For example, a 3rd place winning entry by Betti Fuller portrayed a common milkweed seed head dispersing its fluffy, wind-borne seeds to the wind. Think how pretty are the buds and folded leaves of bloodroot (*Sanguinaria canadensis*) as it approaches flowering. Even at this stage the species is readily identified.

Lee Casebere spearheaded the INPS Photo Contest and is a member of the INPS Central Chapter.

Plant Portrait Category

1st place: *Lynne Tweedie; large-flowered bellwort (*Uvularia grandiflora*)*

2nd place: *Brian Lowry; crested coralroot (*Hexalectris spicata*)*

3rd place: *Betti Fuller; common milkweed (*Asclepias syriaca*)*

Photo Contest

Landscape Scene Category

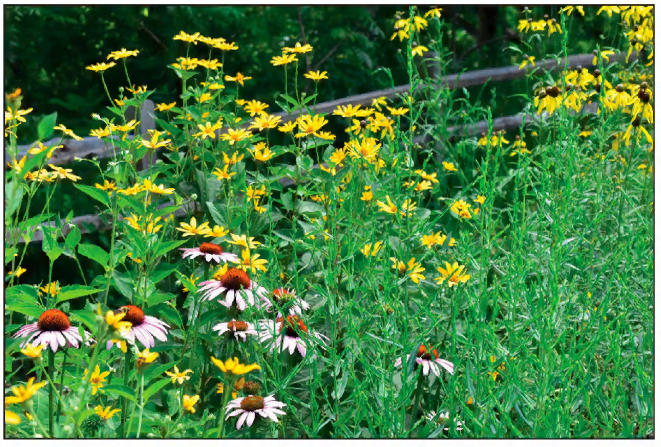
1st place: *Radovan Hajek; A prairie planting of rattlesnake master (*Eryngium yuccifolium*) and dense blazing star (*Liatris spicata*)*

2nd place: *Melanie Helmuth; royal catchfly (*Silene regia*) & yellow coneflower (*Ratibida pinnata*)*

Student Plant Portrait Category

1st place: *C.J. Canino; Michigan lily (*Lilium michiganense*)*

All 2020 Photo Contest winning entries may be viewed at *indiananativeplants.org/inps-sponsored-events/2020-photo-contest/*



3rd place: *Mia Ryan; false sunflower (*Heliopsis helianthoides*), purple coneflower (*Echinacea purpurea*) & yellow coneflower (*Ratibida pinnata*)*

@indiananativeplants.org

Mission

To promote the appreciation, preservation, scientific study, and use of plants native to Indiana.

To teach people about their beauty, diversity, and importance to our environment.

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Submissions: Anyone may submit articles, photos and news items. Acceptance is at the discretion of the editors. Submit text and photos (300 ppi) via email to *journal@indiananativeplants.org*. Query for writer's guidelines. Deadlines: Jan. 1 issue – Oct 22; April 1 issue – Jan. 22; July 1 issue – April 22; Oct. 1 issue – July 22.

Membership: INPS is a not-for-profit 501(c)(3) organization open to the public. Join at *www.indiananativeplants.org*.

Share online: Send information for posting to *webmaster@indiananativeplants.org*.

2020 INPS Biodiversity Grant Awards Announcement

By Alicia Douglass

INPS is pleased to grant funding for four projects to be completed during 2021. Grant awardees include the Clark County Harmful Invasives Removal Project (CCHIRP), Friends of Indiana Dunes, the Johnson County Soil and Water Conservation District (SWCD), and the Wabash Middle School Science Department. A synopsis of each proposed project follows.

CCHIRP was awarded $660 for their Boot Brush Initiative. INPS funds will be used to purchase materials to make five boot brush stations to be placed at the trail heads of the Knobstone Trail in Clark State Forest. Stations will include signage to explain their usefulness in controlling the spread of invasive plants.

Friends of Indiana Dunes was awarded $1,500 to purchase native plants for a black oak savanna demonstration garden at the Indiana Dunes State Park Nature Center. The demonstration garden will provide an educational example of a rare habitat to park visitors. New interpretive programming in combination with the demonstration garden will show the importance of the oak savanna habitat to the overall dune and swale environment.

The Johnson County SWCD was awarded $1,440 for a Little Native Seed Library Trail. INPS funds will be used to purchase four Little Free Libraries and posts. The Little Native Seed Library Trail will utilize existing rain gardens, living landscapes, and prairie plantings throughout Johnson County as demonstration gardens. In total 7 Little Free Libraries will be installed and each library will be stocked with native plant seeds that are reflected in the landscaping. The self-guided trail will allow visitors to explore the differing ways in which native plants can be used on their own property, and each library will contain native plant seed packets that will be harvested from the landscaping itself. Each library will be themed to educate participants on why native plants are vital to Indiana's habitat.

The science department at Wabash Middle School in Wabash, Indiana was awarded a $400 grant for native plant materials to establish a pollinator planting as part of an outdoor learning area. The project will provide ongoing opportunities for the students of Wabash Middle School to engage in outdoor scientific study while learning to appreciate the preservation of our native flora and fauna.

Applications for 2021 biodiversity grant awards will be accepted from September 1 to October 1, 2021. Guidelines are available at indiananativeplants.org/inps-biodiversity-grants/.

Alicia Douglass chairs the INPS Biodiversity Grants Committee and is a member of the East Central chapter.

Eric Schmidt

The Monon Farms HOA - Carmel Adopt-a-Park Program, funded by a 2019-20 biodiversity grant, planted native shrubs along a section of the Monon Greenway in Carmel where invasive species were previously removed.

Jim Reeder

Unitarian Universalist Congregation of Fort Wayne planted a demonstration garden this past summer funded in part by a 2019 biodiversity grant. The completed garden was registered with the National Wildlife Federation under their Sacred Grounds program.

May-apple

By Michael Homoya

Spring would not be spring in Indiana without the presence of May-apples (*Podophyllum peltatum*). It is certainly one of our most common spring-blooming wildflowers as well as one of the most distinctive. No other Indiana plant could be confused with it, at least when it comes to its leaves. Each disk-shaped leaf, of which there is only one or two per plant, measures about 1 foot across bearing sharp-pointed lobes that radiate from a petiole attached to the blade's undersurface (botanically the term for the latter is peltate, hence the epithet, *peltatum*). A May-apple leaf looks something like an umbrella, giving rise to two of its many vernacular names, "parasols" and "umbrella plant." It is also called mandrake, Indian apple, duck's foot, raccoon berry, yellow berry, and wild lemon.

The flowers of forma deamii *have hints of purple, especially in the female pistil.*

Tony Reznicek

Paul Rothrock

May-apple graces Indiana mesic forests with large, distinctively shaped leaves.

May-apple, the most frequently used vernacular name, is thought to refer to its flower that superficially resembles an apple blossom and commonly blooms in the month of May (at least in parts of its range). The fruit has also been referred to as the "apple." When ripe, the interior of the fruit has a pleasant scent, and coatings of the seeds are quite tasty. I liken it to that of passion-fruit. Box turtles are fond of the fruit, and by eating it help to disperse seeds to new locales. Although the ripe fruit is edible (though be cautious since it may have some purgative qualities), the rest of the plant is quite toxic and should not be eaten. Even livestock generally avoid it.

One chemical compound from the rhizome of May-apple, podophyllotoxin, has a long history of use for the treatment of warts and various forms of cancer. Two widely used anticancer drugs, etoposide and teniposide, are semisynthetic derivatives of podophyllotoxin.

The Latin name *Podophyllum* is derived from the Greek *podos*, for foot, and *phyllon*, leaf. M.L. Fernald (in Gray's Manual of Botany) suggests that the name probably refers to the "stout petiole of the radical leaf." That is, the petiole emerges directly from the root (in May-apple, it is technically the rhizome). Perhaps Fernald's suggestion may be true, but another possibility is that its name refers to the leaf shape. If that is so, what foot does the *Podophyllum* leaf resemble? The answer may be revealed in an earlier name used for May-apple, *Anapodophyllum canadense*. Consider this: *Anas* is the genus of several species of ducks, including the familiar Mallard. Perhaps "*Ana*" of *Anapodophyllum* was pulled from *Anas*, and thus *Anapodophyllum* could be unpacked as "duck" – "foot" – "leaf". In fact, as noted earlier, "duck's foot" is one of its common names. While the full leaf of May-apple doesn't appear to resemble a duck's foot, its larger lobes do (at least as much as the feet of Donald Duck do!).

Some May-apple plants take on unusual characteristics. For example, while flowering plants typically have two leaves, in rare cases a flowering individual may have only one leaf. Rarer yet is a form with a stem and flower but no leaves (f. *aphyllum*). The ripe fruit of May-apple is typically yellowish in color, but some, though rare, are maroon. Other parts of the plant may have hints of maroon as well. In 1927 Hoosier botanist Charles Deam collected a plant possessing these characteristics near Mauckport in Harrison County. After propagating it for several years at his home in Bluffton, in 1943 Deam sent rhizomes to the Montreal Botanical Garden. From those plants a botanist at the Garden, Marcel Raymond, described it as a form new to science and named it f. *deamii* in honor of Deam. The plants continue to grow at the Garden to this day (Stéphane M. Bailleul, personal communication).

Michael Homoya was botanist and plant ecologist with the Indiana DNR Division of Nature Preserves from 1982-2019. Currently he plies his trade as an adjunct faculty member at IUPUI. Mike is a past-President of INPS and a member of the Central Chapter.

A May-apple Surprise

By Mark Sheehan

How many photographs of May-apple flowers (*Podophyllum peltatum*) does one amateur botanist need? Spring 2020 marked my 50th year as a wildflower photographer and I found myself asking that question about many species. I still stopped and looked and enjoyed examples of most species, but found little that called for yet another photo. I realized though, toward the end of May, that I hadn't seen a single May-apple flower that year. I missed the waxy white petals, the bright yellow anthers, and the drama of showy flowers hiding beneath big green umbrellas. I made a vow to take a good long look at the next May-apples I ran across, hoping to find a late-season flower.

I work frequently in a forest in northern Brown County, on stony ridges and steep ravines. I had seldom noticed May-apple in the research plots I visit, so I was pleased to happen upon a small population inhabiting a low knoll. Even as I approached, my eye caught a flash of white among the leaves. One flower remained!

The closer I got, though, the more the flower seemed not quite right. Were the petals just a little off white? Maybe the flower was past its prime. But that wasn't all; the profile of the flower was skewed. Had it been crumpled by a predator? Were the petals beginning to detach and fall? As I knelt to take a close look, the truth became clear. What I had taken to be flower petals were actually the wings of moths!

Crowded in a circle around the actual flower, with their heads all pointed toward the peduncle, were half a dozen white slantline moths (*Tetracis chachexiata*). They weren't feeding or pollinating. All were clustered outside the flower, away from nectaries and anthers. Besides, most online sources (e.g., Laverty 1992, Smith 2016, McCormac 2019) say May-apples produce no nectar. Rather than feeding, then, it appears that the moths were using the May-apple flower as a roost—a safe one, presumably, because their wings were almost perfectly camouflaged against the flower petals.

Because the white slantline moth appears to do nothing that benefits the May-apple, the relationship of the two species might be an example of commensalism, i.e., a symbiosis in which one partner benefits while the other is neither harmed nor benefited. If McCormac's (2019) source is correct and white slantline moths also find safe roost on flowering dogwood inflorescences, it would reinforce the idea that the moth benefits from the relationship and any broad, white flower part will attract the moth.

Needless to say, I did photograph the moth-ringed May-apple flower I found that day (see photo below). And I learned that it's important to keep looking, no matter how many photographs we have. Nature always has another lesson for us.

Mark Sheehan

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As part of his retirement, Mark Sheehan provides the invaluable service of monitoring tree growth at IU's Lilly-Dickey Woods in Brown County. He is a member of the INPS South Central Chapter.

Rusts on Native Plants:

By Gregory Shaner

Botany Basics

The COVID-19 pandemic has raised public awareness of infectious disease. But humans and other animals are not the only organisms subject to infection by pathogens. Plants have their diseases, too. Infectious agents of plants include fungi (the most common), viruses, nematodes, bacteria, and others. Although many plant diseases are caused by fungi, most fungi are not pathogenic. They are saprobes—feeding on dead organic matter and important in nutrient recycling.

From an ecological perspective, plant pathogenic fungi have "discovered" a niche to satisfy their nutritional requirements—a living host plant. Many plant pathogenic fungal species lead a kind of dual existence, in that they can infect living plants, but they may also grow and reproduce in dead plant tissues as a saprobe. However, there is one major group of plant pathogenic fungi that can only grow and reproduce in a living host plant—the rusts. Rust fungi are so-named because one of the spore[1] types they produce is various shades of reddish orange or brown, which gives the infected plant a rusty color.

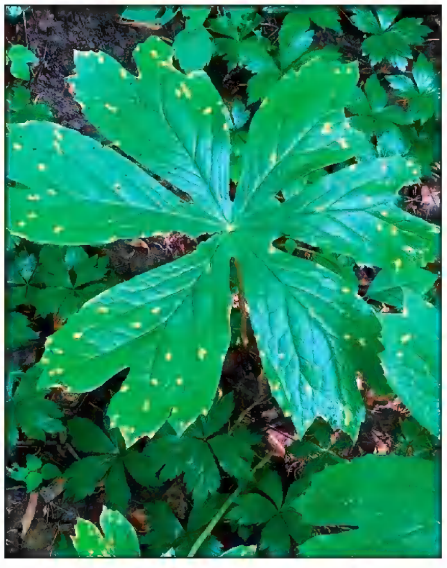
Fungi, once considered part of the plant kingdom, are now categorized in their own kingdom. Technically rust fungi are in the class *Basidiomycota*, order *Pucciniales*. The *Basidiomycota* includes bracket fungi, found on trees, and mushrooms (although not morels, which are commonly called "mushrooms" in Indiana).

There are about 7,000 species of rust fungi. Each species is highly specialized in its range of hosts. A given species of rust may infect only one plant species or a few closely related plant species (with an important wrinkle to be discussed below) (Wikipedia 2020).

Rust fungi have remarkably complex life cycles, with as many as five different spore stages. Some rust species require two different plant host species that are totally unrelated. One of the rusts studied most extensively is the black stem rust on wheat, oat, and barley. To complete its full life cycle, this fungus (*Puccinia graminis*) must also infect barberry (*Berberis* spp.). Spores produced on barberry in the spring subsequently infect small grain cereals. Other species of rust fungi that have all five spore stages complete their life cycle on a single host, such as *Uromyces appendiculatus*, the bean rust fungus (Agrios 2005).

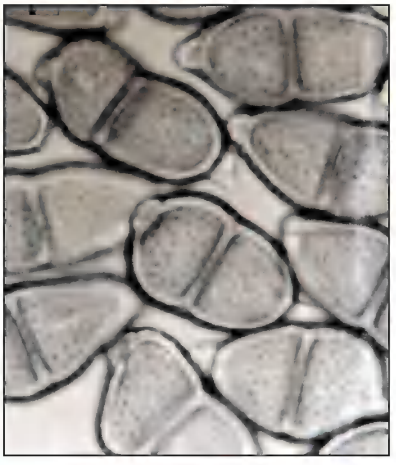
Because rust fungi cannot grow and produce spores in dead plant tissue, in temperate regions they survive the winter, when living host tissue is not available, as

[1] Fungal spores are microscopic structures that are somewhat analogous to seeds in higher plants. Many kinds of spores are dispersed by wind and those that land on a suitable host plant infect and establish a new fungal colony.



All photos by Gregory Shaner

Upper leaf surface of May-apple showing yellow spots where Allodus podophylli *has infected.*



The teliospores of Puccinia mariae-wilsoniae *(seen via a microscope) have thick outer walls that allow them to survive the cold of winter.*

Lower leaf surface of May-apple showing aecia (orange; which produce aeciospores) and telia (black; which produce teliospores) of Allodus podophylli.

No One is Immune

teliospores. These are dark, thick-walled spores capable of remaining dormant during the winter. In the spring they germinate and quickly produce another type of spore (basidiospore) that infects newly emerging plants.

The rust fungi that have been studied most extensively are pathogens of crops, but many other species infect native plants. Two common Indiana spring ephemerals, May-apple (*Podophyllum peltatum*) and spring beauty (*Claytonia virginica*), often show symptoms of rust during the spring. Because of its vegetative reproduction from rhizomes, May-apple is often found in large colonies in woodlands. Some leaves will display pale green or yellow spots. If the leaf is turned over, numerous orange pustules of rust can be seen opposite these spots. These spore masses are termed aecia and the spores are aeciospores.

Allodus podophylli, formerly called *Puccinia podophylli*, is the May-apple rust fungus (Minnus et. al 2012). It does not produce all five spore stages, and it completes its life cycle solely on May-apple (Whetzel et al. 1925). The teliospores survive the winter in soil, where they were shed from the previous season's foliage. As the shoots of May-apple emerge in the spring, the teliospores break dormancy and produce basidiospores, which infect the sheath leaves and stems of young plants. These infections result in more spore production. Infection of the peltate leaves results in formation of orange aeciospores.

In full-cycle rusts such as the black stem rust of small grain cereals, there is a spore stage (urediniospores) capable of causing repeated cycles of infection. During the growing season, infections produced by urediniospores give rise to more pustules and their urediniospores. These wind-blown spores cause more infections such that every host plant over a wide area may eventually be infected. May-apple rust lacks this repeating spore stage, and therefore only scattered plants within a population of May-apple will be rusted, while most neighboring plants will be free of rust. Later in the season, the pustules on the underside of May-apple leaves will become black. These are masses of teliospores, which will carry the fungus over to the next growing season.

The rust on spring beauty is caused by *Puccinia mariae-wilsoniae* (Savile & Parmelee 1956), which is likewise a short-cycle rust that completes its life cycle on this one host. Like May-apple, spring beauty is often found in dense populations in Indiana woodlands during the spring. And, like May-apple rust, only scattered plants will show symptoms—conspicuous orange masses of aeciospores. Infected leaves and stems are often thickened and distorted.

Later in the growing season rusts are commonly spotted on goldenrods (*Solidago* spp.) and ironweeds (*Vernonia* spp.). *Coleosporium vernoniae* is the rust on ironweed. Several species of *Coleosporium* cause rust on *Solidago*, depending on the species; *C. solidaginis* causes rust on *S. canadensis* (C. Aime pers. comm.).

Gregory Shaner

Spring beauty leaf showing aecia (which produce aeciospores) of Puccinia mariae-wilsoniae.

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Gregory Shaner is INPS Secretary.

Florathon Adventures with the Fab Fords

by Granny Rock Star

I had my first taste of Florathon in 2018 with the Quaker Ladies. It was the first year of this competitive fundraising event, and we were four wildflower-loving plant nerds led by a ringer, Norma Wallman, author of Wildflowers of Holliday Park. Our foray was an orderly, slow-paced canvas of the hills overlooking the White River, Norma pointing out all the key sights which she knew like the back of her hand.

It was such a good experience that I vowed to get my family involved in Florathon 2019. I took our INPS action theme "bringing kids to nature" seriously and had been trying for years to lure my grandbabies into a love of the wild. The requisite invitation was extended, and my son's family came down from West Lafayette to Indianapolis to humor Grandma by participating in a wildflower walk in nearby Eagle Creek Park. A nice homemade dinner was promised afterward.

Top: A multigenerational Florathon experience in 2019.

Bottom: Star chickweed, the favorite native plant of the day.

Wendy Ford

I chose for our excursion what I call Wildflower Allee, a portion of the park's trails where I had spotted spring ephemerals in past visits. We parked south of Lilly Lake and ventured forth on the westward trail to see what we could find. The Fab Fords team was on its way: two septuagenarians, two forty-somethings, and two young teenagers.

To my mind, a walk in the Wildflower Allee was supposed to be just that—a walk. But for this family of runners, hurdlers, basketballers, and soccer players a walk meant—exercise! Slow down, everyone, I kept thinking. Look closely. See what delights Nature is offering us. And of course, there were the dogs. Rocky, Ambrose, and Scotty were attentive to everything around us, pulling in every direction, leaving no steady hands for photography. Dutiful granddaughter graciously offered to take a leash, freeing me up to ooh and aah over our finds and snap their pix.

Most everyone was a good sport, exhibiting interest in this and that native plant that Grandma found and bent down to photograph closeup. Obliging son and daughter-in-law practiced repeating the plant names to my cues. Grandson, cloaked in disinterest, busied himself playing with a stick, loath to give any sign that he paid attention to everything said. Hubby, hardly a plant nerd but a devotee of the INPS Facebook group (go figure), was a staunch ally, even pointing out a few wildflowers I had overlooked.

The first of May is prime time for spring ephemerals in Central Indiana, and we found most of the usual suspects including spring beauty (*Claytonia virginica*), false rue-anemone (*Enemion biternatum*), white and purple violets (*Viola* spp.), cutleaf toothwort (*Cardamine concatenata*), round-leaf groundsel (*Packera obovata*), trillium (*Trillium* sp.), plus a surprise patch of pussy toes (*Antennaria* sp.) right next to a paved road. For me the best find of the day was star chickweed (*Stellaria pubera*), a relative of the, well, weedy chickweed (*Stellaria media*) that infests the edges of my home garden, but so cute with its fine, tiny white petals.

I can't honestly say that any sparks of interest in nature were ignited in Wildflower Allee, but we had fun and I did my part as an engaged INPS member by bringing the grandkids to nature and earning a donation to Letha's Youth Outdoors Fund from my dutiful son. We captured the occasion with a family photo at Lilly Lake.

This past year, pandemic looming, the team's original six were down to the two Indy Fords plus dogs. We did our 2020 Florathon at Clegg Memorial Garden, a stop on the way to a socially distanced barbecue at the West Lafayette Fords'. Word to the wise—don't bring the dogs to Clegg Garden. The former country cottage, now the offices of NICHES land trust, sits on a steep hillside overlooking scenic Wildcat Creek, and super-excited Rocky and Ambrose (aka "Lurch") narrowly missed repeatedly catapulting my balance-challenged husband into the ravine. But that's a story for another time.

As for getting the grandkids excited about native plants, we'll try again this year if we can pry them away from track and soccer practice—and get our COVID vaccinations. Wish me luck.

Fab Fords Forever!

Granny Rock Star, better known as Wendy Ford, is INPS Webmaster and former INPS Journal *editor. A retired writer/editor and garden designer, Wendy tends her own native garden in Indianapolis.*

Music - continued from back page

MWNP is located just outside of the town of Geneva, about a mile south of the two-story Queen Anne style Limberlost Cabin, which became a State Historic Site in 1947. It is part of an overall 1800 acres that comprise the Limberlost Conservation Area of which Limberlost Swamp Nature Preserve and the Loblolly Marsh Nature Preserve are the largest. The IDNR Nature Preserves with the help of the Friends of the Limberlost care for the properties.

A century ago no other "ladies" followed Gene's footsteps into the wild lands near Geneva. The times have changed; today ladies, and folks of all stripes, explore the meanders of Limberlost Creek. In the fall the creek can easily be crossed, plus Limberlost Naturalist Curt Burnette leads an annual guided hike during that season.

Along the creek you will find stately oaks (*Quercus* spp.), hickories (*Carya* sp.), hackberry (*Celtis occidentalis*), and sycamore (*Platanus occidentalis*) trees. There are wild blackberries and raspberries (*Rubus* spp.), black snakeroot (*Sanicula* spp.), sedges (*Cyperaceae* spp.), asters (*Symphyotrichum* spp.), thimbleweed (*Anemone virginiana*), and woodland goldenrods (*Solidago* spp.). It is amazing to realize that Gene once spotted the now extinct Passenger Pigeon (*Ectopistes migratorius*) near here.

Snake fences or split rail fences were a favorite of Gene Stratton-Porter. Ken Brunswick, now a board member of the Friends, envisioned a fence enhanced with native plants as Gene would have seen them. In October 2019, he and his grandchildren prepared the ground in anticipation of a snake fence being built. Rebecca Stafford donated plants and Connie Ronald supervised planting in both 2019 and again in October 2020 (also, thanks goes to volunteers Willy De Smet, Melissa Fey, LaDonna Habegger, Randy Lehman, Jack Ronald, Dale Widman, and Zach Widman). Their snake fence plant list included golden Alexanders (*Zizia aurea*), rattlesnake master (*Eryngium yuccifolium*), queen-of-the-prairie (*Filipendula rubra*), wild indigo (*Baptisia* sp.), bergamot (*Monarda fistulosa*), black-eyed Susan (*Rudbeckia hirta*), and dense blazing-star (*Liatris spicata*). "Of all the myriad flowers that distill sweets and call many insects to join in the song of the road none are more beautiful than blazing-star," wrote Gene Stratton-Porter.

Dr. Richard "Doc" Yoder volunteered to construct the 250-foot snake fence in June 2020. Gene wrote, "Many volumes could be filled with the history of old snake-fences, their inhabitants, and environment. Some of our rarest birds home in the shrub-filled corners or swing from branches above, and flowers of unusual beauty are found growing in them and all along the wayside."

The completed project and interpretive sign are clearly visible from US 27 and can be enjoyed from the parking lot. Future plans include building a bridge where the old railroad bridge crossed over the creek and to restore more land closer to the way it looked a century ago.

While Limberlost and Geneva can never be the same as they were in Gene's day, nonetheless you may freely roam the area that inspired her and listen on your own for the "divine and unceasing Song of the Fields."

Terri Gorney is a member of the Northeast Chapter of INPS and vice-president of Friends of the Limberlost.

Paul Rothrock

Liatris *was a favorite of Stratton-Porter.*

"The stems … grow straight toward heaven to a height of from two to three feet … and by swampy and damper roads attained five during the season of 1907."
(from Songs of the Fields*)*

LaDonna Habegger

October 2020: The completed snake-fence and the team of wildflower planters. Left to right: Willy De Smet, Randy Lehman, Connie Ronald, and Jack Ronald.

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Naturalist Profile

Music of the Wild: An Homage to Gene Stratton-Porter

Indiana Historical Society

Gene Stratton-Porter (shortly before her death in 1924) was inspired by Walt Whitman in her love of earth and sky.

By Terri Gorney

"When spring arouses a sleeping earth they are painted in one great, ever-shifting panorama that stretches beyond as our vision, and the world is filled with the songs of nature…. Here dotted with wild trees and outlined with lichen and vine-covered old snake fences, every corner of which is filled with shrubs and bushes sheltering singing birds and insects, the great song festival of the fields is held."

- Gene Stratton-Porter

Music of the Wild is a non-fiction book penned and photographed by Gene Stratton-Porter in 1910. Part II of the study is called Song of the Fields. Gene mentioned obliging landowners Armantrout, Bone, Grove, Rayn, and Shaffer that allowed her to do field studies and, using her heavy large format camera and glass emulsion plates, photograph the terrain and biota along Limberlost Creek.

A map from the same period allows historians to pinpoint where her research was conducted. Today, inspired by Gene's writings, this area has become the Music of the Wild Nature Preserve (MWNP). Thanks to the vision of Ken Brunswick, the now retired Indiana DNR East Central Regional Ecologist, the Friends of the Limberlost purchased the first 39 acres in 2005 with a grant from the U.S. Fish and Wildlife Service. Limberlost Conservation Association sold Friends the land at a bargain price. The Friends were able to purchase an additional 14 acres of upland ground. Fittingly, this land connects to the 12-acre Bird Sanctuary that was bought in 1947 by the then fledgling Limberlost Conservation Association, preservationists from Geneva.

Music *- continued on page15*